f. Implications for Forest Plan Alternatives

Plan alternatives were designed to address public issues As a result, most
alternatives, including the preferred alternative, incorporate objectives for
retention of mature and old-growth timber for wildlife, scenery, and recreational
purposes. Pine marten and pileated woodpecker areas will be overlapped with areas
selected for other purposes, such as unroaded recreation areas and special
interest areas, wherever these meet habitat suitability and distribution
requirements. Methods resulting in the opportunity cost shown in Table G-10 would
benefit other resource uses as well

g. Role of Monitoring and Research

The Forest Monitoring Plan (Forest Plan, Chapter V) calls for monitoring
populations and habitats of pileated woodpecker and pine marten. At scheduled
plan reviews, these data will be considered in determining the suitability and
effectiveness of the selected way for meeting the Management Requirement for
viable populations. This is important in testing the appropriateness of the
selected modeling assumptions.

Information needs include.

    Dispersal distances for pileated woodpeckers and pine marten:
    -    How far can juveniles successfully disperse?
    -    As habitat becomes increasingly fragmented, what is the ability of
         dispersing individuals to locate habitat islands?
    -    What effect does the size of habitat sites have on the ability of
         dispersing individuals to locate these sites?

    Size of the mature/old growth conifer habitat sites:
    -    Utilization of habitat sites, particularly as the sites become more
         isolated.
    -    Reproductive success within habitat sites.
    -    Home range size in fragmented forests.

    Utilization and reproductive success of pileated woodpeckers and pine marten
    in mature/old growth conifer sites managed on a 240-year rotation (i.e., are
    managed sites meeting habitat needs as compared to natural stands)?

    Population density, home range size and distribution of pine marten in eastern
    Oregon.

E. SPECIFICATIONS FOR MEETING REQUIREMENTS FOR DISPERSAL OF CREATED OPENINGS

1. Source of the
Management Requirement

Direction for harvest dispersion comes from several sources. The National Forest
Management Act [Section 6(g)(3)(F)] sets broad direction that the Forest Service
is to, among other things, identify maximum sizes for openings created by harvest
activities (created openings). This is further defined in the National Forest
Management Act implementing regulations [36 CFR 219.27(d)] and in the Regional
Guide for the Pacific Northwest Region (pages 3-7 and 3-8).

2. Description of the Management Requirement The specifications or standards for achievement of the harvest dispersion Management Requirement are:

a A harvested area of commercial forest land will no longer be considered a created opening, for silvicultural purposes, when stocking surveys, carried out in accordance with Regional Instructions, indicate prescribed tree stocking that is at least 4 1/2 feet high and free to grow

b. The maximum size limit of harvest openings on the Malheur National Forest is 40 acres Some exceptions are permitted in specific situations

c Harvest openings will be separated by blocks of land that generally are adequately stocked with trees that are at least 4 1/2 feet high and that contain one or more logical harvest units of similar size.

d Harvest openings which touch each other are not precluded, but will be considered a single opening in determining compliance with harvest area maximum size limits

e Harvest openings contiguous to 30-acre or larger natural openings are subject to the 40-acre maximum size limit, but normally should not exceed one-third the size of the natural opening and not occupy more than one-third of the natural opening perimeter.

f Harvest openings should not be created adjacent to any natural openings (regardless of size) unless adequate vegetation along the edge of the natural opening can be developed or retained in sufficient density to protect wildlife and meet visual management objectives

3. Alternative ways of Meeting the Management Requirement for Dispersion The selected modeling assumption is that 4-1/2 foot trees will generally be achieved within 10 years of a regeneration harvest. Achieving a 4-1/2 foot tree height in 10 years requires rapid reforestation and good growth on the newly-established stand Prompt reforestation of lodgepole pine sites has occurred consistently on the Forest even though natural regeneration is by far the dominant means of stand establishment Rapid establishment of mixed conifer and ponderosa pine/Douglas-fir sites has been less reliable across the Forest For this reason an alternative set of modeling assumptions was evaluated Under these alternative modeling assumptions, it was assumed that the average time required to reach a 4-1/2 foot tree height in a lodgepole pine stand would be 10 years, and that for regeneration in other timber types the average time required would be 15 years This results in a dispersion constraint of 25 percent on all timber types

Two other alternative modeling assumptions were considered, but were not developed in detail The alternative of constraining the rate of regeneration harvest in all timber working groups to 25 percent was considered This would be the maximum rate at which regeneration could occur, without corners touching, if a checkerboard harvesting model were assumed This alternative was not considered in detail because it was obvious that opportunity costs would be greater than with the selected assumption

Also considered was the assumption that up to 50 percent of an analysis area could be harvested per decade. This could occur under a checkerboard modeling assumption, but only if corners of units were permitted to touch and such adjacent openings were not considered one opening This was not considered in detail since it would not meet the Management Requirement specifications established by the Regional Guide (i.e., that openings which touch or corner must be considered a single opening with regard to the maximum opening size standard).

The ways of meeting the Management Requirement for harvest dispersion were modeled in FORPLAN by constraining the rate of regeneration harvest For example, using 4-1/2 feet in 10 years and given a continuous stand of mature timber, it is not possible to harvest more than one-third of the area per decade (on the average) and still meet the requirements from the National Forest Management Act regulations and the Regional Guide This was determined as follows:

In a theoretical, homogeneous timber stand, made up of numerous smaller stands (represented by the smaller squares making up the large square in the figure below) it is possible to harvest 1/3 of the area in the first decade (those squares labeled "1"), 1/3 in the second decade ("2"), and 1/3 in the third decade ("3"), without corners of created openings touching To do this assumes that an area which is harvested in decade 1 will no longer be a created opening in decade 2 and one created in decade 2 will no longer be a created opening in decade 3. Hence, in the FORPLAN model a constraint was applied which limited the rate of regeneration harvest, for any analysis area, to 33 percent of the area per decade. This represents the maximum rate at which an analysis area can be scheduled for harvest.

This relationship can also be depicted by the following equation·

$D = 1/H \times P/C \times 100$ Where,

D = the dispersion constraint in percent,
H = the number of harvest entries needed to access the entire analysis area without having openings adjacent to each other or having corners touching,
P = the FORPLAN period in years (this is always 10), and
C = the number of years for a created opening to close (the length of time required for a new stand to reach 4-1/2 feet in height).

In the case of the above example, and assuming that a 4-1/2 foot tree height can be reached in 10 years, the equation is as follows·

$D = 1/H \times P/C \times 100$

   $= 1/3 \times 10/10 \times 100 = 33\%$

4. Evaluation of Implementation Methods to Meet Harvest Dispersion Management Requirements

Either of the alternative means or implementation methods noted above would meet Management Requirements

a. Opportunity Costs

Table G-10 displays the opportunity costs associated with the two sets of alternative analysis assumptions considered in detail for meeting the timber harvest dispersion Management Requirement

The reduction in Present Net Value per unit loss of Allowable Sale Quantity in meeting the harvest dispersion Management Requirement is disproportionately high as compared to the effects of the other Management Requirements on Present Net Value. This occurs because the lower ASQ is not accompanied by a corresponding reduction in management costs In fact, some management costs may actually increase with implementation of harvest dispersion requirements For example, to meet the harvest dispersion Management Requirement it may be necessary to accelerate development of roadless areas (resulting in additional road development costs), delay harvest of high-value timber on some lands, or use faster (and more expensive) reforestation methods to reduce the length of time that an area is considered a created opening
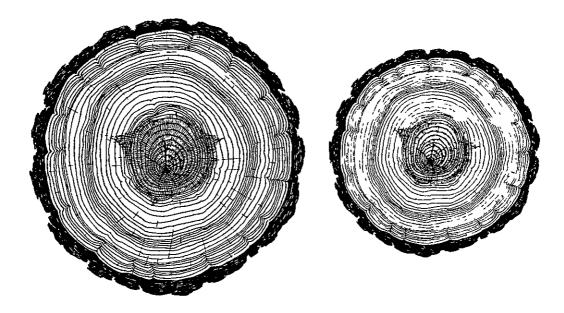
TABLE G-10

APPROXIMATE CHANGE (OPPORTUNITY COST) ASSOCIATED WITH MEETING THE HARVEST DISPERSION MANAGEMENT REQUIREMENT

	FIRST DECADE ALLOWABLE SALE QUANTITY MMCF/YR [1] (MMBF/YR) [2]	CHANGE IN ALLOWABLE SALE QUANTITY [3]	PRESENT NET VALUE MM$ [4]	CHANGE IN PRESENT NET VALUE
VALUE				
Maximum PNV Benchmark as Displayed in the Final EIS	53.9 (304.9)	---	638.6	---
Opportunity Cost Approximate Change.				
Opportunity Cost of the Selected Way for Meeting the Harvest Dispersion Management Requirement (10 yrs for all species)	2.5 (14.0)	5%	55 2	9%
Opportunity Cost of Meeting the Harvest Dispersion Management Requirement Using a Modeling Assumption of 10 years for lodgepole pine and 15 years for Other Working Groups [5]	4.0 (22.9)	9%	88.3	14%

1/MMCF/YR = Millions of cubic feet per year
2/MMBF/YR = Millions of board feet per year
3/Percent change calculated on cubic foot basis
4/MM$ = Millions of dollars
5/Estimate, based on analysis outside of FORPLAN

b. Consequences of the Different Ways of Meeting the Management Requirement

The 10-year assumption alternative provides a higher timber harvest and Present Net Value than the 10- to 15-year alternative assumption, although reforestation costs in the former will be higher. Assuming a 10-year period for lodgepole pine types and a 15-year period for other types would result in reduced PNV due to first-decade harvest reductions as shown in Table G-10

The 10-year assumptions would result in a slightly more rapid rate of old-growth reduction, loss of big-game thermal cover, and risk of adverse soil and water effects These differences from the 10- to 15-year assumptions however, are not large enough to be considered significant.

The analysis shows that the 10- to 15-year assumption Allowable Sale Quantity opportunity cost is not quite twice that of the 10-year alternative assumption The Present Net Value opportunity cost for the 10-15 year assumption is 44 percent higher than for the 10-year assumption

c Rationale for the Selected Method

The selected set of modeling assumptions was chosen because existing data indicate that achieving a 4-1/2 foot tree height in 10 years on all forest types is probably feasible This alternative also provides a higher Allowable Sale Quantity and Present Net Value. Effects on other resources are negligible With increased reforestation efforts for mixed conifer, ponderosa pine/Douglas-fir sites, it is reasonable to expect that this alternative can be implemented successfully The additional expense which may be necessary to assure rapid reforestation is justified by the increased timber availability and Present Net Value which will result Implementation monitoring will provide the basis for tracking regeneration success Should intensified reforestation fall short, future plan amendment would be an appropriate remedy

d. Implications for Forest Plan Alternatives

Considering opportunity costs, Forest Plan alternatives with the harvest dispersion constraints have less Present Net Value and associated Allowable Sale Quantity than those same alternatives without dispersion constraints

e. Role of Monitoring and Research

Monitoring of harvest dispersion will occur during the life of the Plan with several objectives. Monitoring will be used to determine whether or not actual outputs are consistent with those projected by the FORPLAN model using the modeling assumptions applied. Also, the actual time required, on the average, for new stands to reach 4-1/2 feet in height will be monitored This is important in testing the appropriateness of the selected modeling assumptions Also see Forest Monitoring Plan (Forest Plan, Chapter V)